Massachusetts Innovative Science Assessment

April 2023

MASSACHUSETTS DEPARTMENT OF ELEMENTARY AND SECONDARY EDUCATION

Executive Summary – Innovative Assessment Costs and Benefits

Why innovate on assessments?

- Assessment, curriculum and instruction should be aligned.
- State assessment is a strong lever for influencing classroom instruction.

Benefits of the new science assessment

Science should be taught in **meaningful context**	→	New test uses **real-world scenarios** to put questions in context
Science teachers feel pressure to **focus on coverage** rather than depth	→	New test goes **deeper on fewer standards**
Schools do **"MCAS prep"** focused on surface-level knowledge	→	New performance tasks focus on the **doing of science** *(science and engineering practices)*
Concerns about **cultural inclusivity** in curriculum, instruction and assessment	→	New test portrays **diverse students and adults** doing science

What teachers are saying about the innovative assessment…

Some of this stuff….it really does make you think. You can have the knowledge, but you really have to apply it and figure it out. ***You can't memorize your way through this one.*** *You have to think, you have to make sense of it.*

This is innovative in a way that allows for student sense-making. You don't have to "teach to" this. This will help us ***move away from MCAS prep and focus more on the science skills*** *that we should be focusing on.*

"It is more about the ***skill of doing science****. Looking for patterns and connections. More authentic"*

Timeline for the Innovative Science Assessment

Innovative Assessment initiative launched (Oct. 2019)

2019-20

Massachusetts's IADA proposal approved

Foundation funds awarded (Apr 2020)

Test development begins, vendors contracted (July 2020)

2020-21

Federal grant funds awarded (Fall 2020)

Grade 5 and 8 pilot of innovative performance tasks (June 2021)

2021-22 and 2022-23

Continue piloting

- Expand number of students
- Refine tasks
- Introduce new innovations
- Begin to establish a recurring development timeline and process
- Scores are not counted

2023-24 and 2024-25

Prepare for statewide use

- Recruit representative students
- Lock in test design for field test
- Conduct data review of tasks and approve for operational use
- FY24 cost: ~$3.8m
- FY25 cost TBD, but expected to add ~$1.5M per year to MCAS contract

Future Years

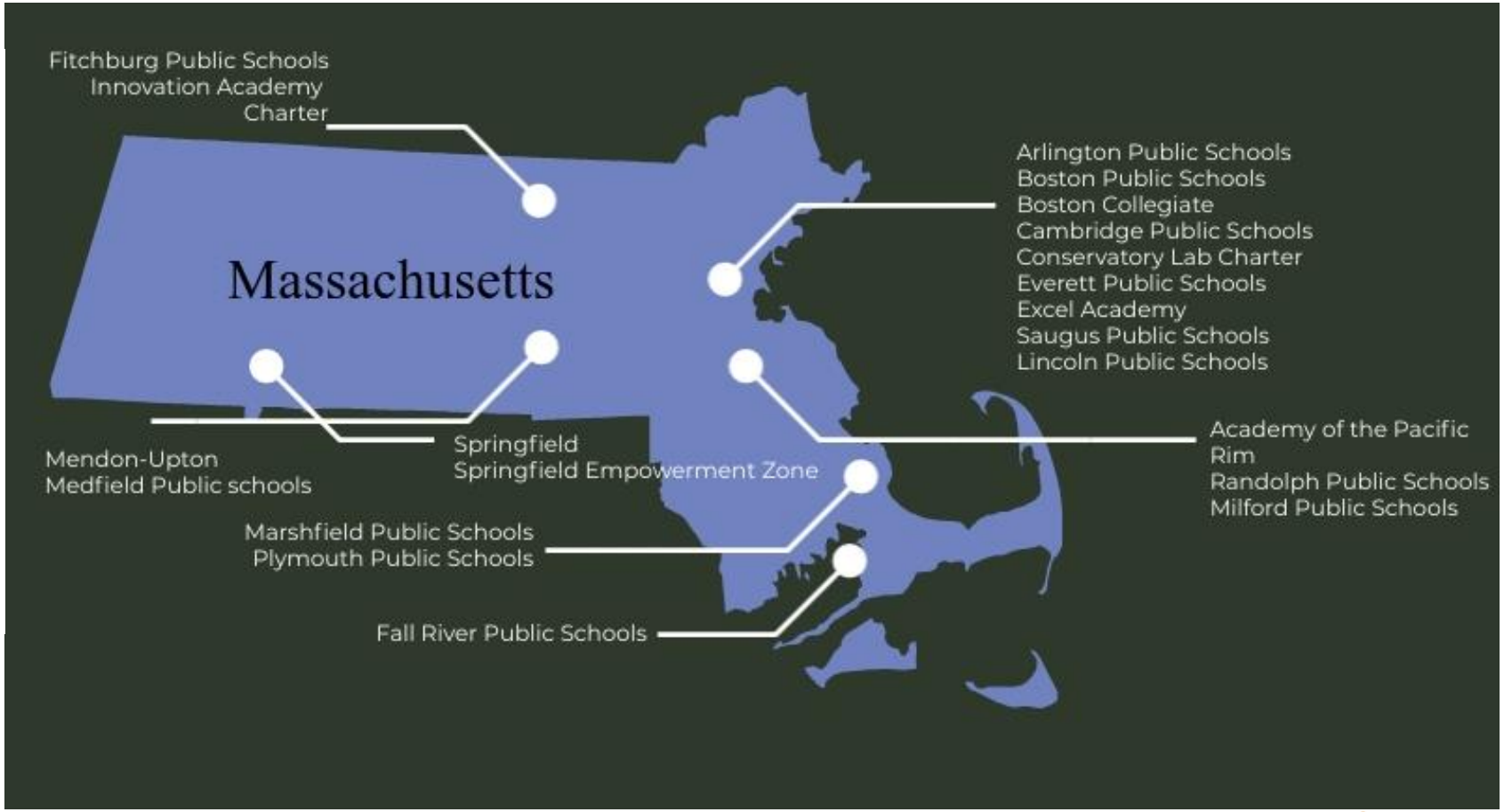
Tasks used for official scores

Plan for single statewide test design

Innovative Science Assessment SY22-23 Pilot Participation

13,122 Students

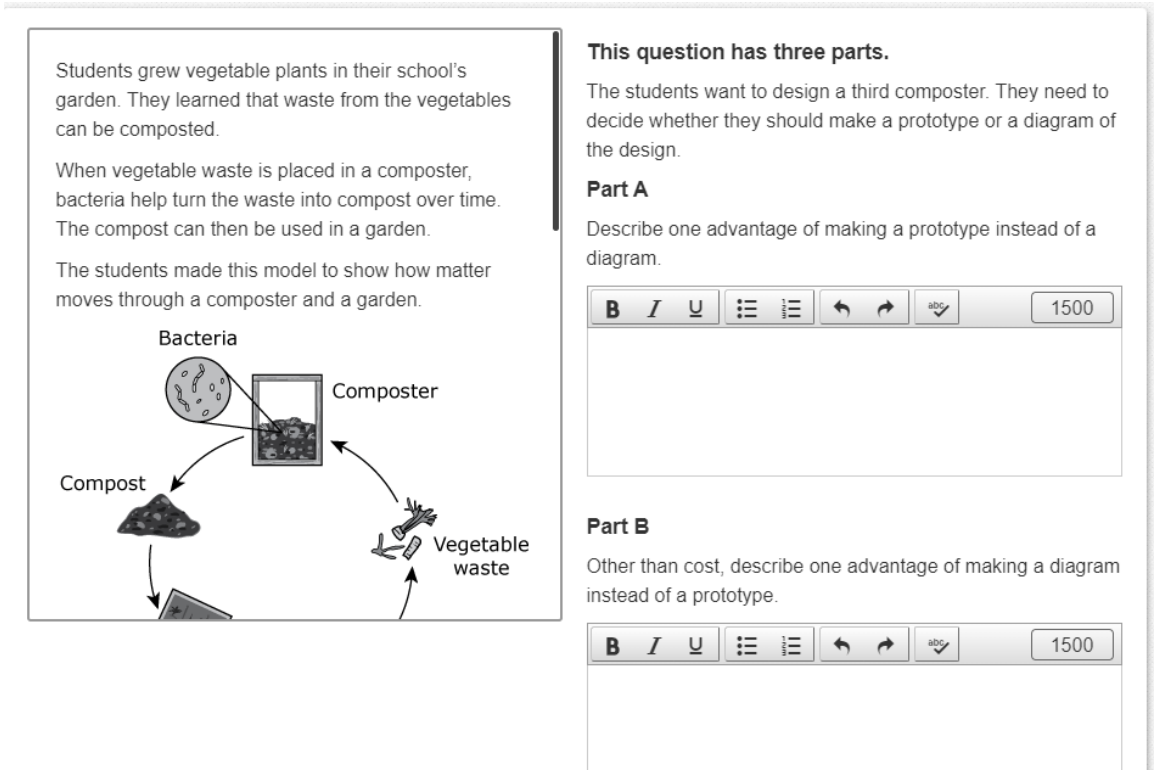
13.4% English Language Learners 10.8% in MA	12.2% African-American Students 9.3% in MA
29.9% Hispanic Students 22.3% in MA	47.9% Economically Disadvantaged 34.4% in MA



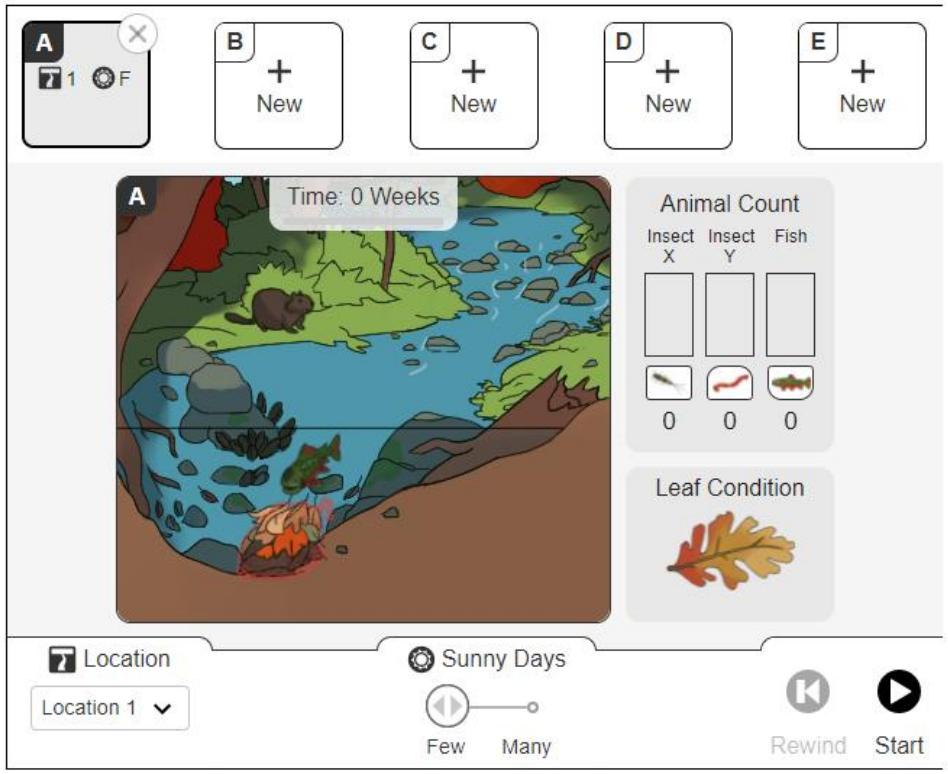
What is the innovative assessment?

The simulations ask students to interact with a science or engineering phenomenon to demonstrate their knowledge.

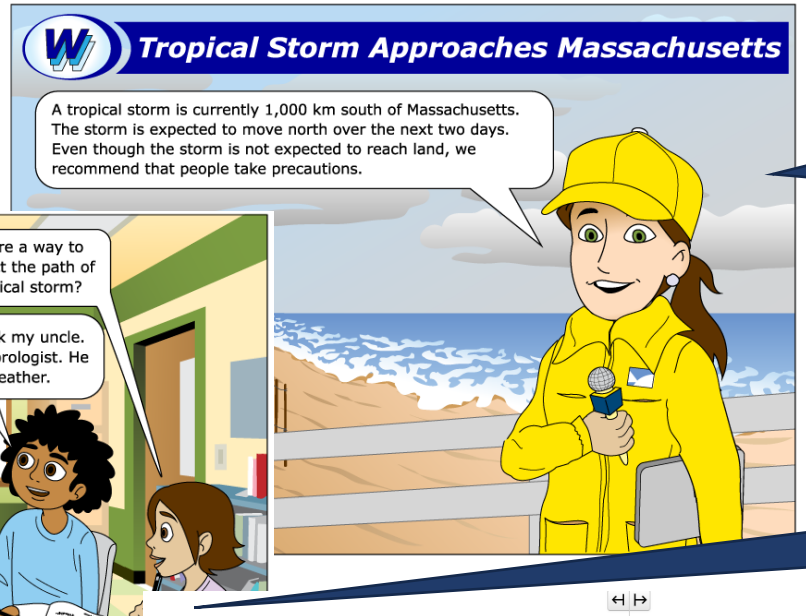
Current NextGen MCAS

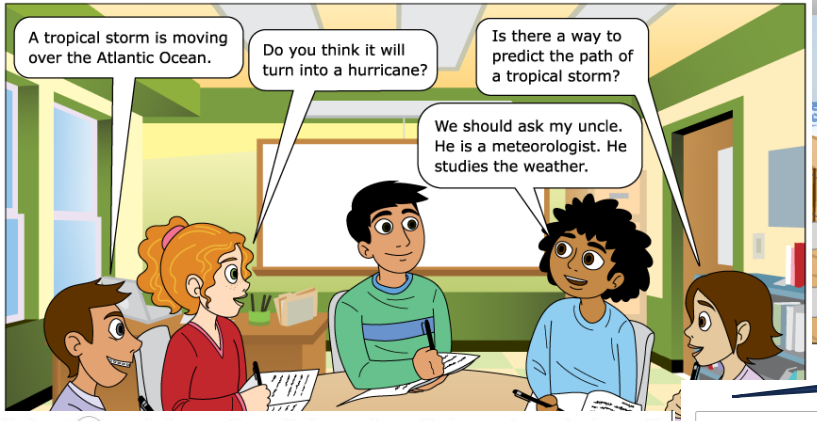


Innovative Performance Task

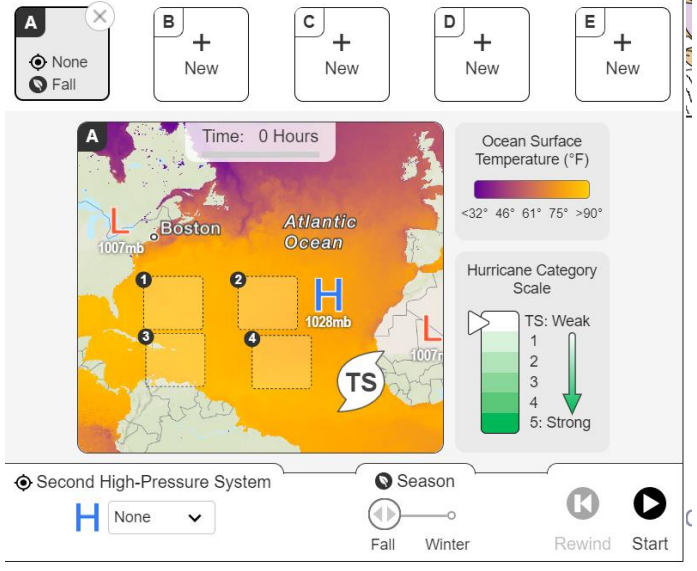


Students do interactive work related to real-world problems.

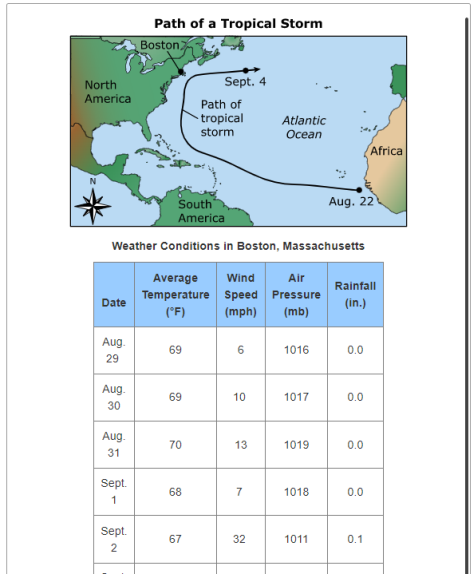


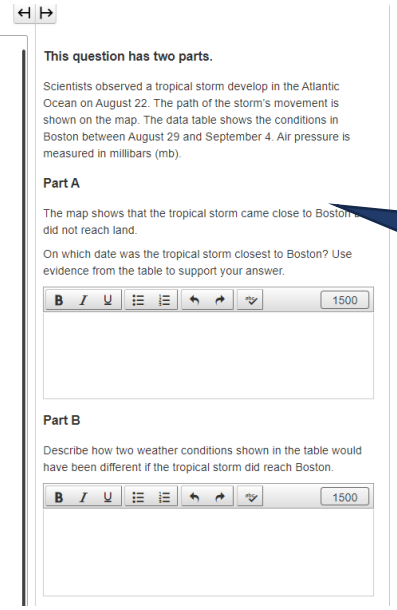


Illustrating phenomena in the real world



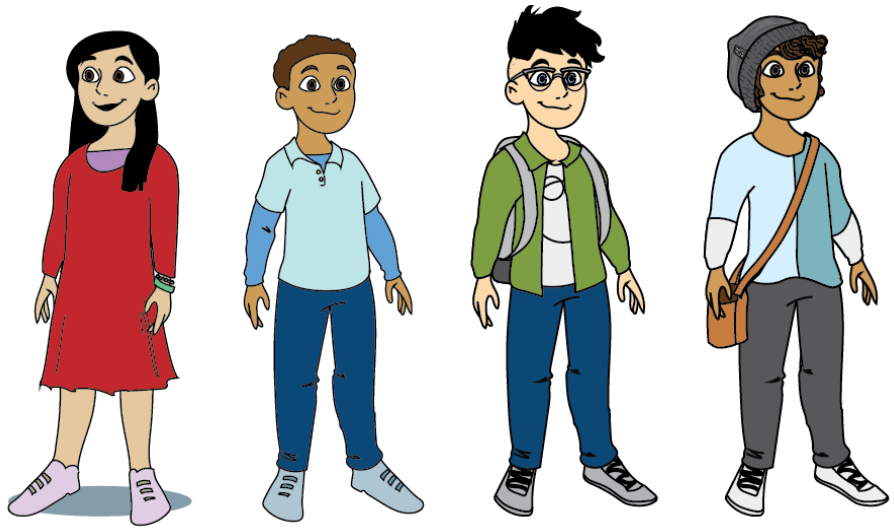
Students set up experiments and analyze data

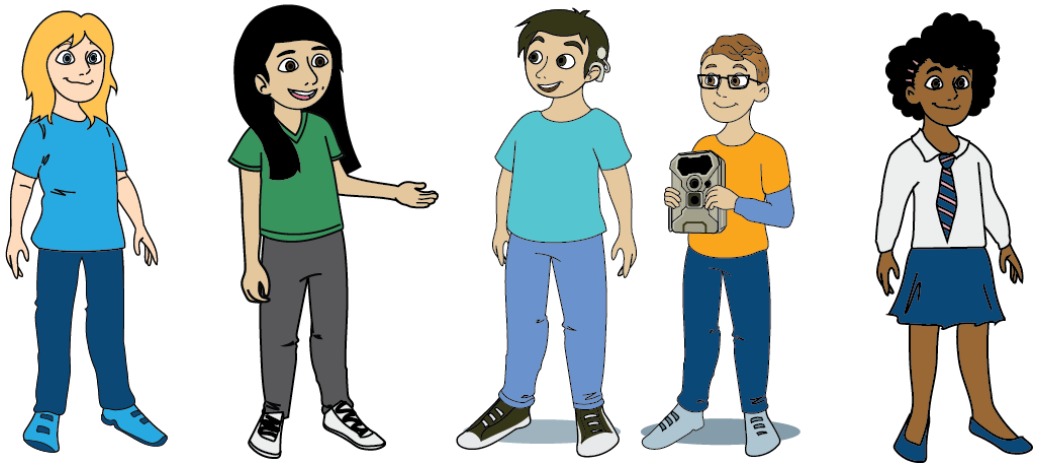


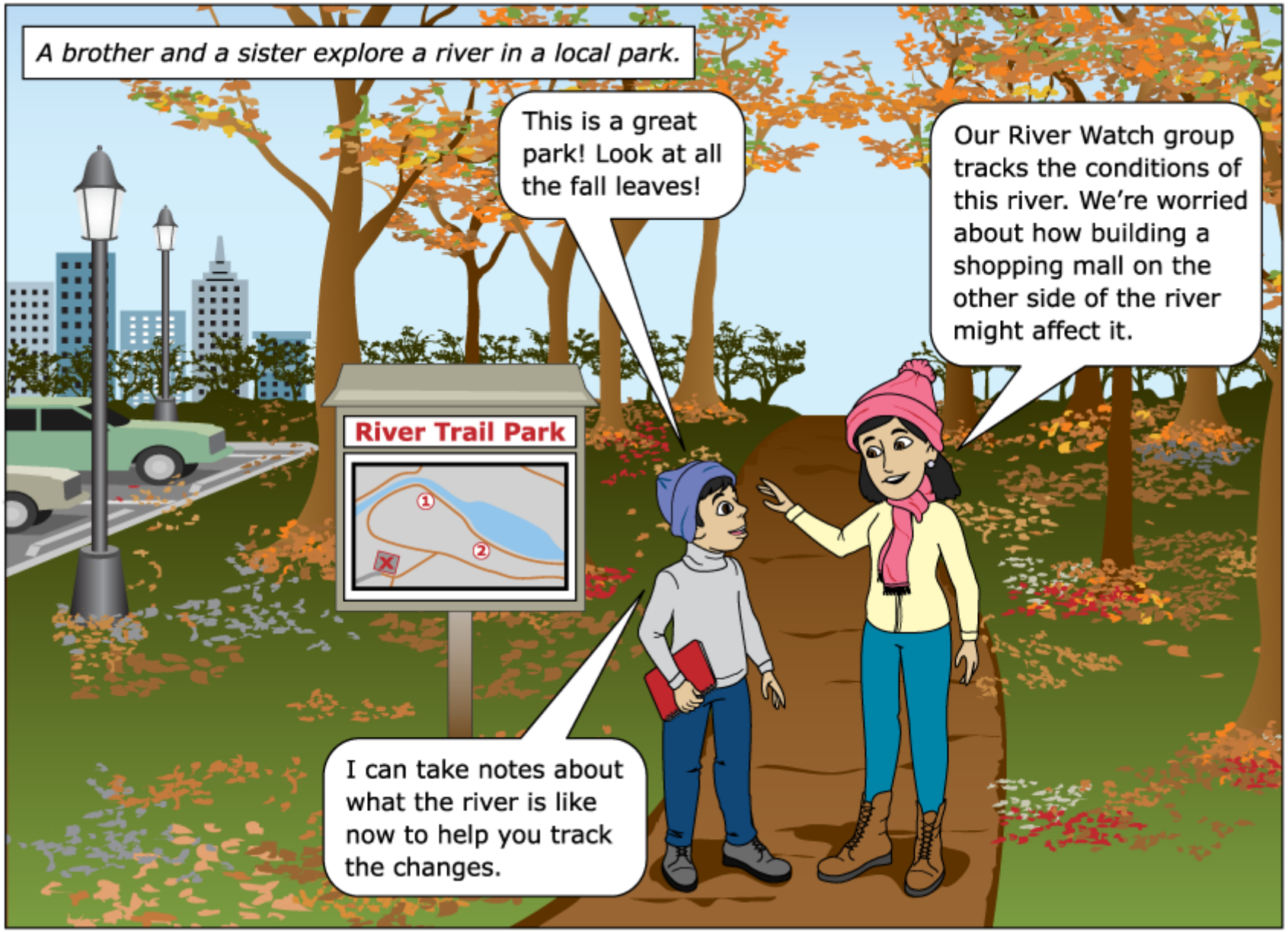


Students need to develop written arguments and explanations

Student and Adult Representation

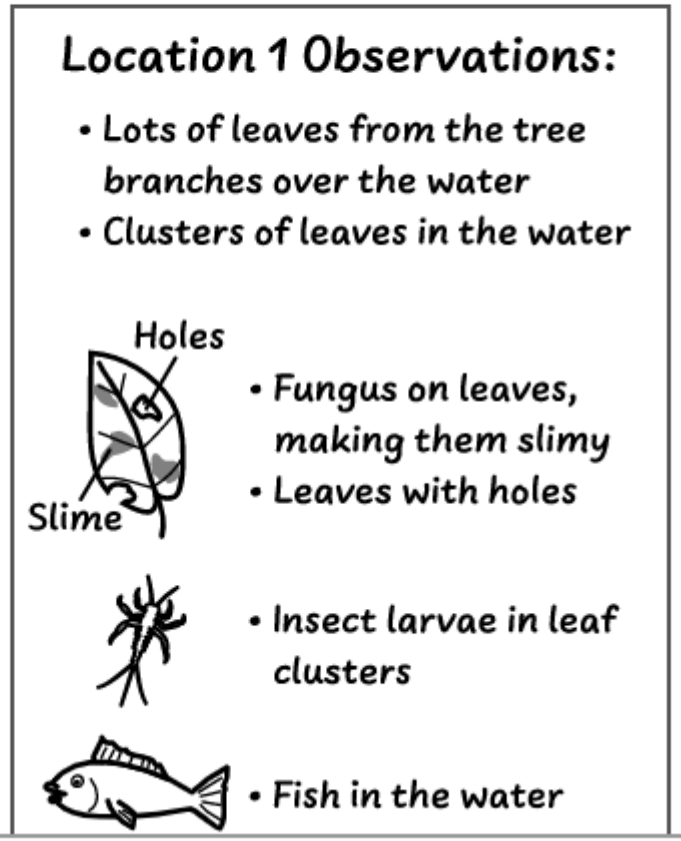





A brother and a sister explore a river in a local park.
This is a great park! Look at all the fall leaves!
Our River Watch group tracks the conditions of this river. We're worried about how building a shopping mall on the other side of the river might affect it.
River Trail Park
1
2
X
I can take notes about what the river is like now to help you track the changes.


See how the leaves collect behind the rocks? Those leaf clusters can tell us about the organisms in the river.
Hey! I see small things moving in the leaves!

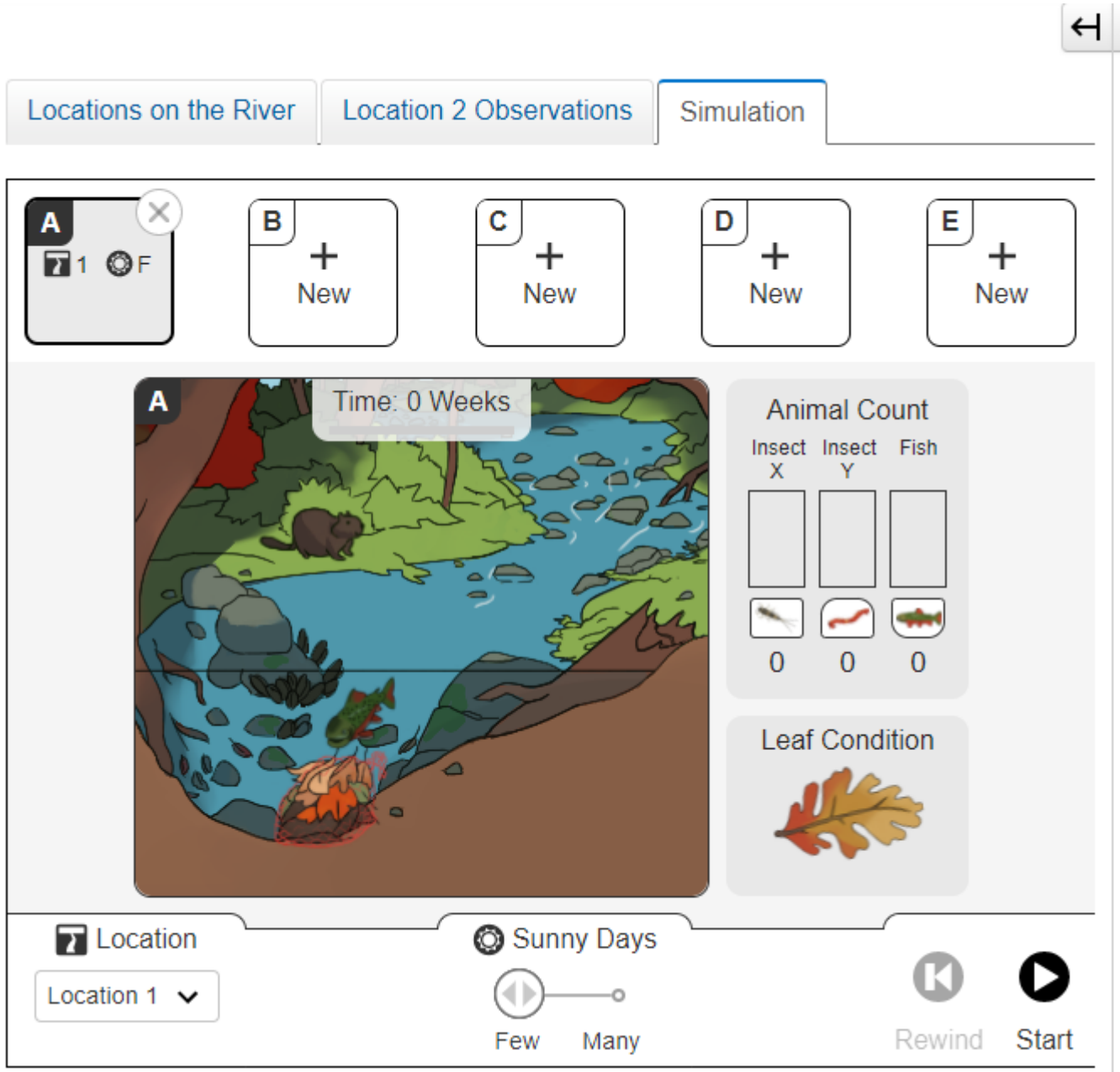
Location 1 Observations | Leaf Cluster



Use the Location 1 Observations and the Leaf Cluster picture to identify the role of the fungus in the river ecosystem.

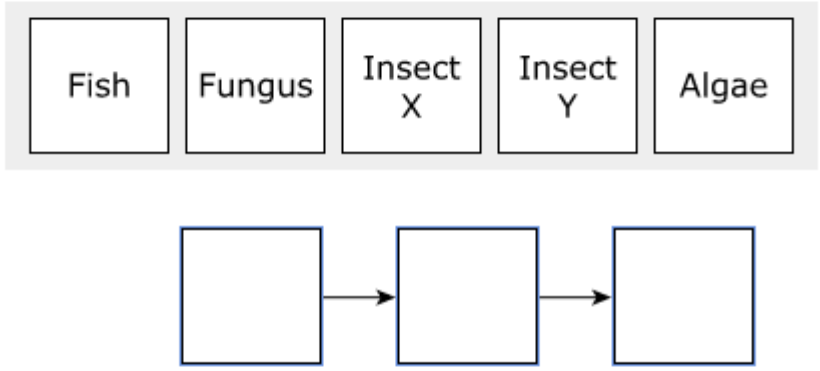
Select from the drop-down menus to correctly complete the sentences.

The fungus found on the leaves is a [Choose...] . The observation that **best** supports this conclusion is that the leaf cluster [Choose...] .



Use your saved trial of Location 2 with many sunny days and the student's Location 2 Observations to help the student add an entry in his notebook.

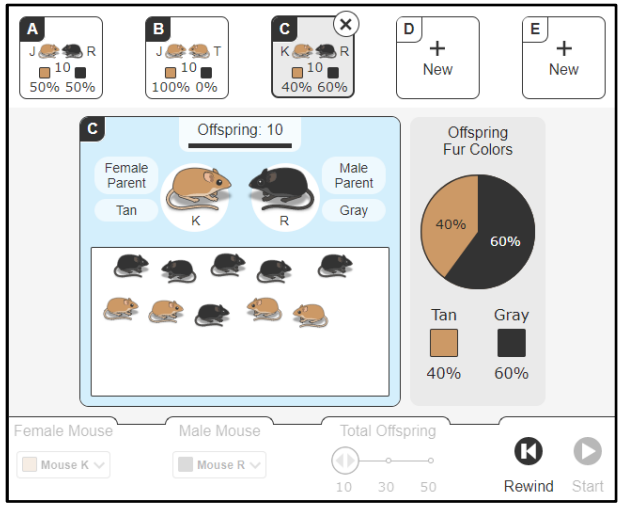
Drag and drop an organism into each box to show the flow of matter at Location 2. Not all organisms will be used.



Who is involved in creating the new assessment?

DESE Teams
- Innovative Assessments
- MCAS team
- Kaleidoscope
- Instructional Support

Test Developers
- WestEd *(science experts)*
- Concord Consortium *(science simulations)*
- Pearson *(platform and admin)*



Innovative Science Assessment

Advisory Groups
- Racial Imbalance
- English Learner / Bilingual
- Special Education
- Science Leaders Network

Pilot Teachers and Students
- Content committees
- Bias & sensitivity committee
- Research with students
- Prototype trials with students

What students are saying…

What did you like best about this test?

- "I like how it is **interactive and entertaining** while you are still testing your knowledge at the same time."
- "It was **similar to doing experiments** in science class instead of being memory-based"
- "I liked that we were able to **use our own data** from our own experiments and not take them out of an article or a data table like usual.

What did you like least about this test?

- "I did not like how many **direction and scene pages** there were, it made the test way longer than it should have been!"
- "The **instructions on the simulations** were very confusing"
- "I didn't like **how much text there was** because it got a little confusing where to read things or where not to."

- **70% of G5 and 61% of G8** said they could **show their knowledge of science** on the test (*Definitely or Somewhat*)
- **59% of G5 and 65% of G8** reported having **done experiments or simulations on the computer** in their science class
- Average **testing time is similar to MCAS STE** for students taking the innovative assessment.